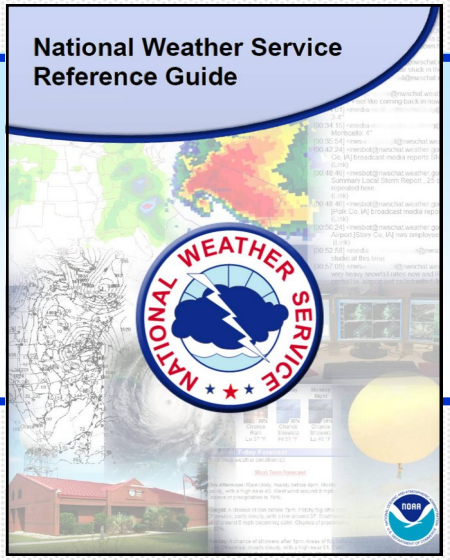

1. What is the National Weather Service?

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1. What is the National Weather Service?

The National Weather Service (NWS) is a Federal agency under the National Oceanic and Atmospheric Administration (NOAA). Both NOAA and the NWS are agencies of the United States Department of Commerce (DOC). Formerly known as the Weather Bureau until January 1971, the NWS is comprised of meteorologists, hydrologists, hydro-meteorological technicians, climatologists, electronics technicians, computer specialists and management personnel. The NWS provides weather products and services in three major areas:

1.) *Official weather and water watches, advisories and warnings*
2.) *Data collection and weather/water forecasts*
3.) *Climate data and forecasts*

Department of Commerce (DOC)
www.commerce.gov

National Oceanic and Atmospheric Administration (NOAA)
www.noaa.gov

National Weather Service (NWS)
www.weather.gov

Users of NWS Products and Services

NWS data and products form a national informational database infrastructure that can be used by other government agencies, the media, the private sector and the general public.


Courtesy FEMA


Courtesy FAA

National Weather Service Mission Statement

The National Weather Service (NWS) provides weather, water and climate data, forecasts and warnings for the protection of life and property and the enhancement of the national economy.

View of inundated areas in New Orleans following the breaking of levees surrounding the city as the result of Hurricane Katrina in 2005.

Washington DC metro area snowstorm February 5-6, 2010.

Joplin, MO tornado aftermath, May 22, 2011

Building a Weather-Ready Nation

http://www.nws.noaa.gov/com/weatherreadynation/

The vision for the NWS' strategic plan is "**a Weather-Ready Nation: society is prepared for and responds to weather-dependent events.**" Weather-Ready Nation is a strategic alignment that starts with this vision and ends with actions by individuals and businesses to save lives and livelihoods. Here's how the pieces fit together:

- The NWS's vision has led to our "Roadmap to a Weather-Ready Nation". The NWS Roadmap includes a number of initiatives, including developing specific practical test projects throughout the country.

- It's about myriad actions we can take internally and with partners that integrate with our Roadmap, plan and vision. All of these activities and those being designed in the Roadmap are to fulfill a singular purpose: protect lives and livelihoods by helping people make better decisions with better information.

- The Weather-Ready Nation communications campaign called a "WRN National Dialogue" is about inspiring existing partners and gaining new ones to join us in realizing our vision of a Weather-Ready Nation.

The Weather-Ready National Dialogue will help us answer the tough questions about what more can be done to improve forecasting and readiness. A primary focus is how NWS can evolve its decision support services to better assist our Nation's emergency management community. The success of NWS decision support services should not just be measured by the accuracy of our information, but by the effectiveness of its application. NWS has important actions underway and through our Roadmap's test projects, we will pursue innovative ideas to improve the value and use of weather services. This includes working closely with America's Weather and Climate Industry. Some specific actions include:

- Improving weather decision support services with new initiatives such as the development of mobile-ready emergency response specialist teams that can be embedded in Emergency Operations Centers or dispatched in the field with first responders before, during, and after natural disasters.

- Implementing innovative technological solutions such as the nationwide deployment of Dual Polarization radar technology and the Joint Polar Satellite System.

- Product improvements that will include: tornado warnings, specifically for EF3-5 tornadoes, with better accuracy and fewer false alarms; floods and GIS inundation maps several days (e.g., 5-7) before river crests; improved hurricane intensity and storm surge forecasts; and more viable warning messages based on a collaboration with social scientists and emergency managers.

- Enhanced support to emergency management and community leaders/planners in mitigation and recovery with an outcome of a new level of being StormReady® and TsunamiReady™. Much can be done to increase a community's awareness of weather hazards and mitigation efforts that minimize the loss of life and property. Mitigation efforts could include, for example, increasing a building's wind-resistant capabilities, or moving buildings out of a flood-prone area.

"Building a Weather-ready nation is everyone's responsibility," said Eddie Hicks, International Association of Emergency Managers USA past president. "It starts with National Weather Service and emergency managers, like the U.S. Council of International Association of Emergency Managers, but it ends with actions by individuals and businesses to reduce their risks. The more prepared communities are for destructive weather, the less of a human and economic toll we'll experience in the future, and that's a

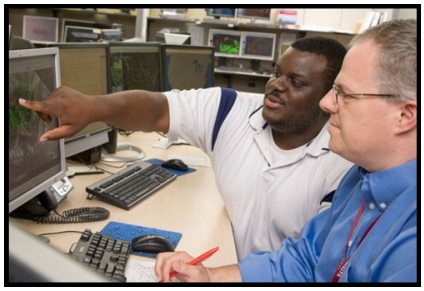
http://www.nws.noaa.gov/com/weatherreadynation/

NWS Roadmap

The National Weather Service released our new Strategic Plan in 2011. The National Weather Service's new strategic vision, a "Weather-Ready Nation", is about building community resilience in the face of increasing vulnerability to extreme weather. To help us achieve our vision we have developed a sustainable "**Roadmap**" – a bridge between our high-level Strategic plan and our annual operating plans - that lays the foundation for future NWS services. Our Roadmap consists of four distinct plans: a business plan, a workforce plan, a science and technology plan, and a services plan. Most relevant to emergency managers is our focus to evolve the decision-support services we provide you – the major theme of our services plan. NWS aims to better understand and respond to the needs, thresholds and decision criteria of EMs. The intent is to move our decision-support services beyond the patchwork of offices currently operating this way and into the framework of how NWS conducts business as an agency. Align NWS structure, systems, technology and staffing to better support enhanced decision support services. It's a paradigm shift from "producing products and hitting enter" to "providing expert consultation services". NWS becomes an indispensable part of your team. A practical approach that is able to adapt and accounts for the level of resources available to support investments in NWS capabilities.

Emergency Response Specialists

The evolution of NWS' workforce as outlined in our Roadmap formally creates **Emergency Response Specialist (ERS)** positions. ERS personnel will be NIMS-certified forecasters, trained in diverse disciplines, that will serve as NWS' first responders working on-site or remotely with EMs/Incident Management Teams during a significant environmental event. The ERS positions will utilize the proven Incident Meteorologist (IMET) approach, the customer service and communications skills of our WCMs/SCHs, and the state-of-the-science knowledge base of our SOOs. They will be an effective hybrid position that will allow NWS to take our Impact-Based Decision Support Services (IDSS) to the next level. In addition, all forecasters in Weather Forecast Offices (WFOs) and River Forecast Centers (RFCs) will receive training in IDSS and be prepared to deliver either production or decision support services on demand.

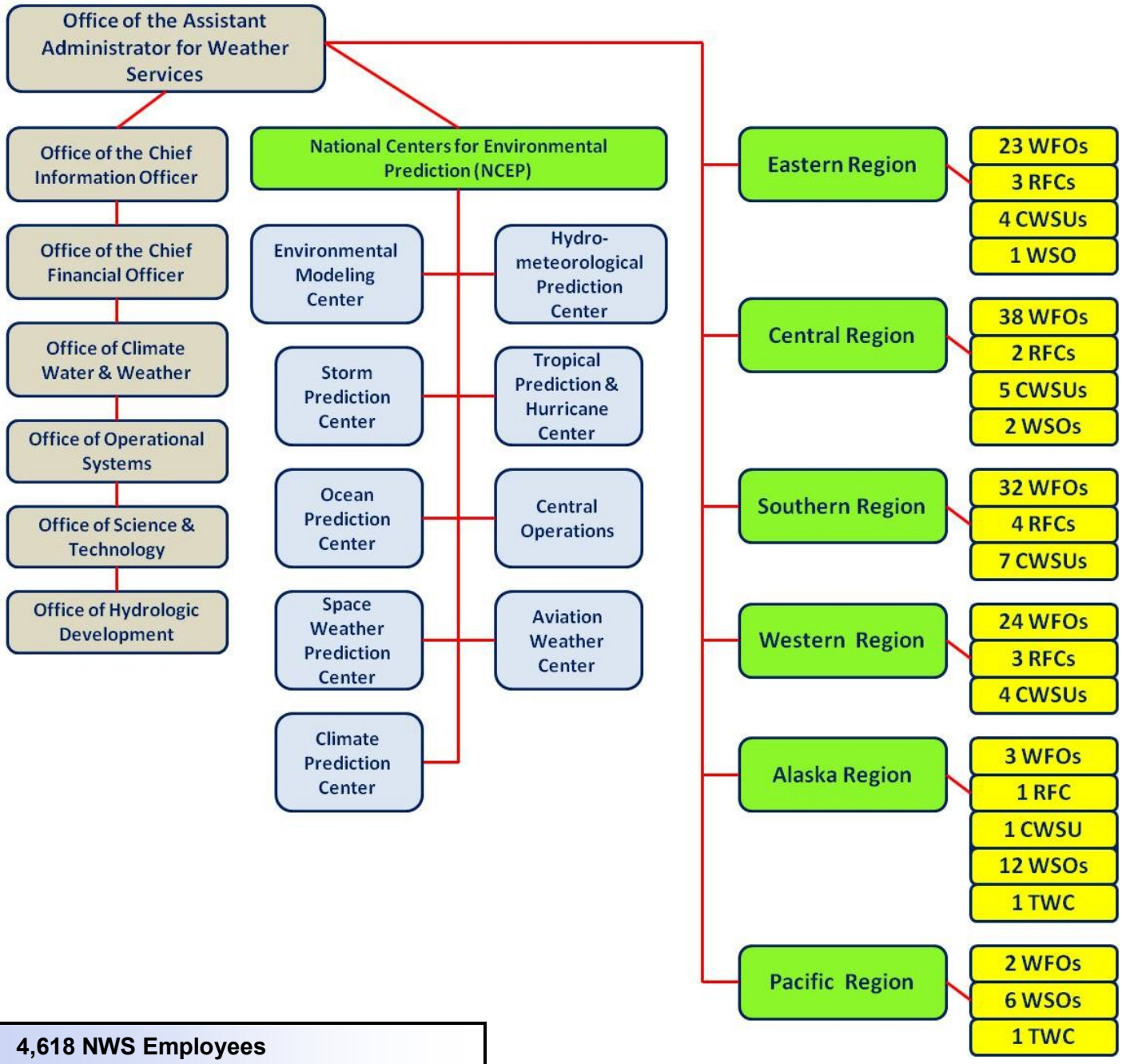


Weather-Ready Nation Pilot Projects

NWS has built **pilot projects** to test key Roadmap concepts in our field offices. Staffing has been augmented to support a "build a little…test a little… field a little" approach. There are currently six pilot projects underway:

1) **NWS Operations Center** (NWS Headquarters, Silver Spring, MD) - supports national situation awareness with weather information and decision support for federal agency-level partners (e.g., DHS, FEMA HQ).
2) **NWS Regional Operations Centers** (NWS Southern Region Headquarters, Fort Worth, TX) - supports regional situation awareness with weather information and decision support (e.g., FEMA Regional HQs, State EOCs).
3) **Provision of IDSS in a coastal environment** (WFO New Orleans, LA) - service focus areas include: Port of New Orleans, HAZMAT, Tropical Weather, Marine Forecasting Challenges, and Strategic Petroleum Reserve.
4) **Provision of IDSS in an urban environment** (WFO Baltimore/Washington, DC) - service focus areas include: Homeland Security, Large Outdoor Events, Transportation, Winter Storms, and Multi-jurisdiction coordination.
5) **Integrated environmental services** (WFO Tampa Bay, FL) - service focus areas include: Sensitive ecosystems, Port of Tampa, Marine Navigation, Lightning, and Public Health.
6) **Mesoscale meteorology science to operations** (WFO Charleston, WV) Thunderstorm forecast improvement, "Warn-on-Forecast" experimentation, Winter storms, Flooding rains, and the influence of rugged terrain.

NWS Organizational Structure



- 4,618 NWS Employees
- 122 Weather Forecast Offices
- 13 River Forecast Centers
- 21 Center Weather Service Units
- 21 Weather Service Offices
- 2 Tsunami Warning Centers
- 9 NCEP Centers
- 6 Regional Headquarters

Headquarters Offices

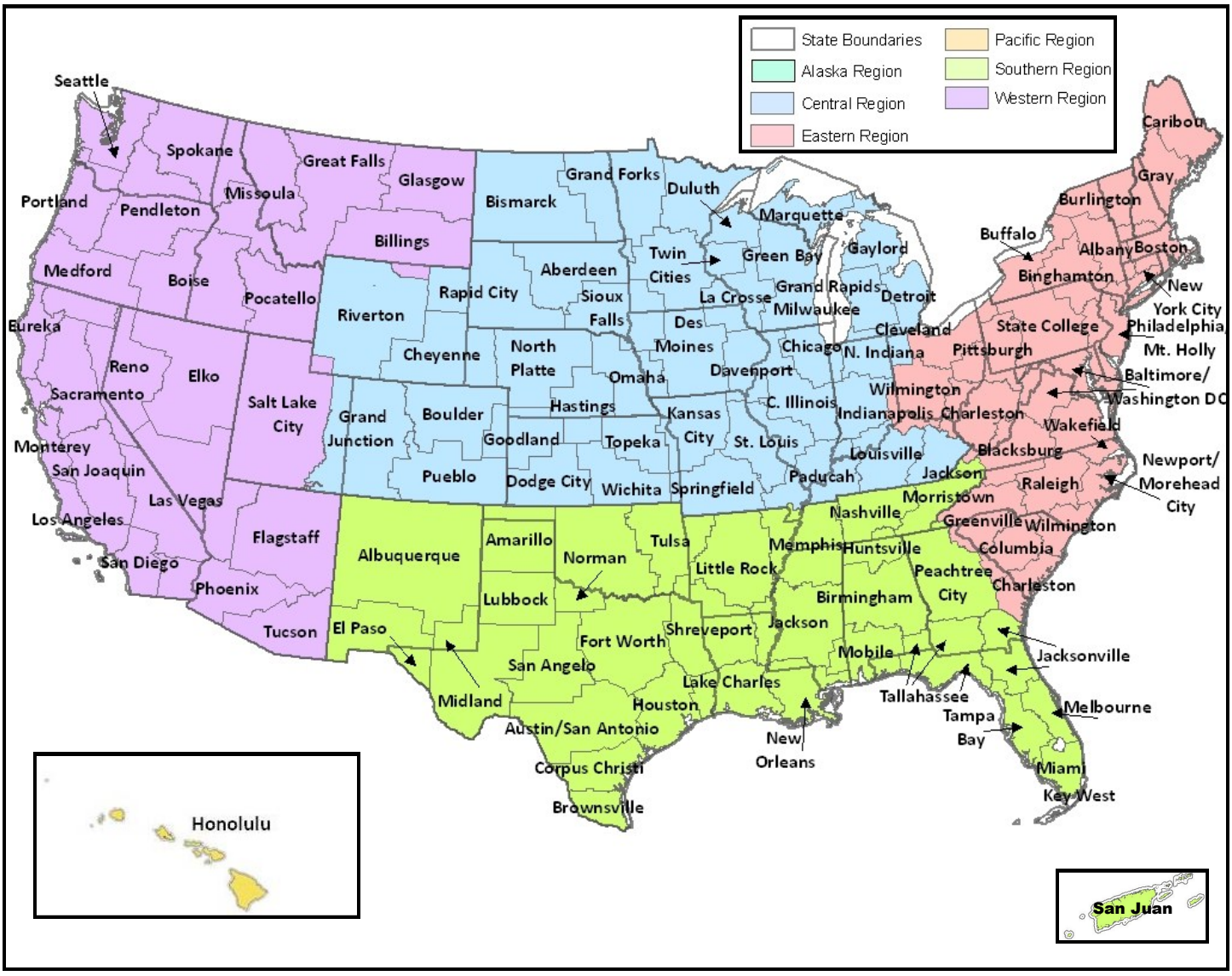
NCEP Offices

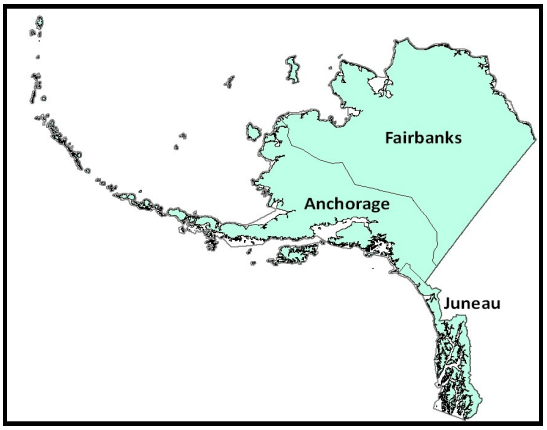
Regional Headquarters Offices

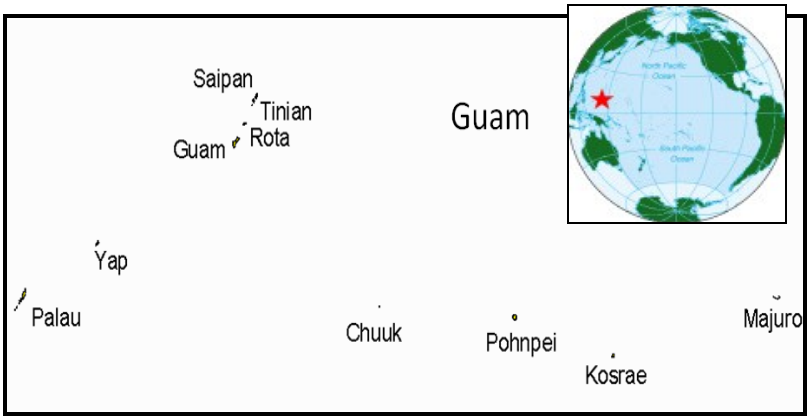
Weather Forecast Offices (WFO)
River Forecast Centers (RFC)
Center Weather Service Units (CWSU)
Weather Service Offices (WSO)
Tsunami Warning Center (TWC)

County Warning Areas (CWA)

Each WFO is given an area of responsibility, known as a County Warning Area or CWA for most forecast offices. The CWAs include the 564 Federally recognized Tribal governments. Alaska office areas are simply referred to as Areas of Responsibility and are comprised of boroughs. There are 122 WFOs in the NWS, which span the continental US, Alaska, Hawaii, Guam and Puerto Rico. All WFOs are responsible for issuing products and providing services to the counties in their CWA.







WFO IDs by State

Alabama
- BMX Birmingham
- HUN Huntsville
- MOB Mobile

Alaska
- AFC Anchorage
- AFG Fairbanks
- AJK Juneau

American Samoa
- STU Pago Pago

Arizona
- FGZ Flagstaff
- PSR Phoenix
- TWC Tucson

Arkansas
- LZK Little Rock

California
- EKA Eureka
- LOX Los Angeles
- STO Sacramento
- SGX San Diego
- MTR San Francisco
- HNX San Joaquin Valley

Colorado
- BOU Denver/Boulder
- GJT Grand Junction
- PUB Pueblo

Florida
- JAX Jacksonville
- KEY Key West
- MLB Melbourne
- MFL Miami
- TAE Tallahassee
- TBW Tampa Bay Area

Georgia
- FFC Atlanta

Guam
- GUM Guam

Hawaii
- HNL Honolulu

Idaho
- BOI Boise
- PIH Pocatello/Idaho Falls

Illinois
- ILX Central Illinois
- LOT Chicago

Indiana
- IND Indianapolis
- IWX Northern Indiana

Iowa
- DMX Des Moines
- DVN Quad Cities

Kansas
- DDC Dodge City
- GLD Goodland
- TOP Topeka
- ICT Wichita

Kentucky
- JKL Jackson
- LMK Louisville
- PAH Paducah

Louisiana
- LCH Lake Charles
- LIX New Orleans
- SHV Shreveport

Maine
- CAR Caribou
- GYX Portland/Gray

Massachusetts
- BOX Boston

Michigan
- DTX Detroit
- GRR Grand Rapids
- MQT Marquette
- APX Gaylord

Minnesota
- DLH Duluth
- MPX Minneapolis

Mississippi
- JAN Jackson

Missouri
- EAX Kansas City
- SGF Springfield
- LSX St. Louis

Montana
- BYZ Billings
- GGW Glasgow
- TFX Great Falls
- MSO Missoula

Nebraska
- GID Hastings
- LBF North Platte
- OAX Omaha

Nevada
- LKN Elko
- VEF Las Vegas
- REV Reno

New Jersey
- PHI Philadelphia/Mt. Holly

New Mexico
- ABQ Albuquerque

New York
- ALY Albany
- BGM Binghamton
- BUF Buffalo
- OKX New York City

North Carolina
- MHX Newport/Morehead City
- RAH Raleigh/Durham
- ILM Wilmington

North Dakota
- BIS Bismarck
- FGF Grand Forks

Ohio
- CLE Cleveland
- ILN Wilmington

Oklahoma
- OUN Oklahoma City/ Norman
- TSA Tulsa

Oregon
- MFR Medford
- PDT Pendleton
- PQR Portland

Pennsylvania
- CTP State College
- PHI Philadelphia
- PBZ Pittsburgh

Puerto Rico
- SJU San Juan

South Carolina
- CHS Charleston
- CAE Columbia
- GSP Greenville

South Dakota
- ABR Aberdeen
- UNR Rapid City
- FSD Sioux Falls

Tennessee
- MRX Knoxville
- MEG Memphis
- OHX Nashville

Texas
- AMA Amarillo
- EWX Austin/San Antonio
- BRO Brownsville
- CRP Corpus Christi
- FWD Dallas/Fort Worth
- EPZ El Paso
- HGX Houston/Galveston
- LUB Lubbock
- MAF Midland/Odessa
- SJT San Angelo

Utah
- SLC Salt Lake City

Vermont
- BTV Burlington

Virginia
- LWX Baltimore/Washington
- RNK Blacksburg
- AKQ Wakefield

Washington
- SEW Seattle/Tacoma
- OTX Spokane

West Virginia
- RLX Charleston

Wisconsin
- GRB Green Bay
- ARX La Crosse
- MKX Milwaukee

Wyoming
- CYS Cheyenne
- RIW Riverton

NWS Weather Forecast Office (WFO) Staff

NWS forecast offices operate 24 hours a day, 365 days a year. At each WFO, roughly one third of the personnel on station are comprised of managers and support staff. The tables below show the different positions in each of these categories. The other two thirds of the staff are comprised of forecasters and technicians. Management, program leaders and electronics technicians all work a typical daytime Monday through Friday schedule. On the other hand, the forecasters and hydro-meteorological technicians work rotating shifts to make sure the office is staffed 24 hours a day. Typically, there are two or three forecasters/hydro-meteorological technicians on shift at a time. However, during periods of active weather, such as severe weather outbreaks, extra staff may be utilized to support operations.

Management

Meteorologist-in-Charge (MIC)
Electronics Systems Analyst (ESA)
Science and Operations Officer (SOO)
Warning Coordination Meteorologist (WCM)
Data Acquisition Program Manager (DAPM) (some offices)

Support Staff

Administrative Assistant (ASA)
Information Technology Officer (ITO)
Service Hydrologist (some offices)
Observation Program Leader (OPL) (some offices)

Operational Staff

Senior Forecasters (4-6 per office)
General Forecasters (4-6 per office)
Meteorologist: Interns (1-4 per office)
Hydro-Meteorological Technicians (1-4 per office)
Electronics Technicians (2-3 per office)

These positions are described in greater detail in the next two pages

NWS WFO Staff

Meteorologist-in-Charge (MIC)

The MIC carries full managerial, supervisory and technical responsibility for the provision of weather warnings, forecasts, services and support activities within the area served by the WFO, and for the conduct of important scientific development work which is undertaken in an operational weather forecast environment.

Electronics Systems Analyst (ESA)

The ESA serves as the site's lead technical focal point for maintenance on all electronic systems and electronic equipment for assigned local and remote areas and serves as the immediate supervisor for the site's field maintenance electronics staff.

Science and Operations Officer (SOO)

The SOO is in place to ensure the scientific integrity of the products and services provided to the public by the WFO and also to lead or participate in joint research projects and developmental efforts conducted with any collocated university/ research center. The SOO is expected to initiate and oversee the transfer of new technologies from the research community to the operational environment, to promote the development of local forecast techniques, to establish professional staff enrichment activities and to evaluate and improve the professional operational activities of the office.

Warning Coordination Meteorologist (WCM)

The WCM serves as the principal interface between the WFO and the users of WFO products and services in leading the effort to ensure their evaluation, adjustment and improvement. The WCM is fully responsible for planning, coordinating, and carrying out the WFO area-wide public awareness program designed to educate the public to ensure the mitigation of death, injury and property damage or loss caused by severe natural hydrometeorological events. The WCM also leads and coordinates WFO staff efforts and provides direction, guidance, instructions and assistance to the staff in the conduct of weather service operations.

Data Acquisition Program Manager (DAPM)

The DAPM supervises a technical staff in activities which can be divided into three major categories: Data management and acquisition, public service and user interaction and forecaster assistance. The incumbent supervises a technical staff comprised of three or four hydro-meteorological technicians or interns. The DAPM schedules these employees, makes work assignments, assigns work priorities and adjusts work as necessary. The DAPM evaluates the work performance of the technical staff, counsels employees concerning their performance, conduct and work progress, evaluates their training needs and recommends significant personnel actions. An office has a DAPM or Observation Program Leader (described on next page), not both.

Administrative Assistant (ASA)

The ASA is the principal administrative assistant to the MIC and performs a wide range of administrative functions for the staff management team. The ASA performs technical aspects of all administrative programs and activities for the office related to budget, funds control, purchasing, procurement requests, contract monitoring, bankcard, property, vehicles, travel, training, personnel actions, time and attendance, mail, office supplies and equipment, etc.

Information Technology Officer (ITO)

The ITO establishes and performs tasks necessary to plan, design, develop, acquire, document, test, implement, integrate, maintain, or modify systems for solving problems or accomplishing work processes by using computers. This includes analyzing and evaluating work concerned with integrated systems of computer programs and/or computer equipment. The ITO applies available technologies and basic management principles to adapt computer methods to a variety of subject matter situations. The ITO also oversees/performs equipment installation or relocation, testing and acceptance processes and responds to and resolves problems with software, hardware and systems management.

Service Hydrologist (SH)

The Service Hydrologist is responsible for providing the primary NWS hydrologic support and interface to the state emergency management and other water resources-related agencies. The hydrologist serves as the "resident expert" on WFO hydrometeorological technologies as they relate to mesoscale hydrologic forecast problems and their application to meeting the diverse requirements existing in the designated support area.

Observation Program Leader (OPL)

The OPL ensures that a full range of technical support and assistance is provided for WFO operations and other basic activities, especially the incorporation of timely, high quality observational data into WFO forecast and warning decision -making processes. The high quality observational data is used extensively to support NOAA's climate mission. The OPL is a team leader of a staff for data management, acquisition and quality and user interaction. The incumbent also assists forecasters during the forecast process. An office has a DAPM or an OPL, not both.

Senior Forecaster

The Senior Forecaster serves as shift leader, routinely supervising at least one General Forecaster and one Hydro-meteorological Technician or Intern. The Senior Forecaster ensures the provision of general weather information, warnings, advisories and forecasts to the general public and special user groups in the WFO service area. The Senior Forecaster is responsible for all NWS service products, warnings and advisories produced on the shift and for their coordination with other NWS offices. The forecaster leads and coordinates WFO staff efforts and provides direction, guidance, instructions and assistance to the shift staff. During an assigned shift, the forecaster is responsible for integrating all meteorological data available from a variety of sources, and for analyzing and assessing the current and forecast weather situation at both the synoptic and mesoscale levels. The forecaster devises and formulates all necessary warning, advisory and forecast products assigned to his/her forecast "desk", with emphasis on meeting the needs of the user.

General Forecaster

The General Forecaster provides general weather information, warnings, advisories, aviation and public forecasts to the general public and to special user groups in the WFO service area. The forecaster is responsible for the coordination of NWS products, warnings and forecasts with other staff on duty. During an assigned shift, the forecaster is responsible for integrating all meteorological data available from a variety of sources, and for analyzing and assessing the current and forecast weather situation at both the synoptic and mesoscale levels. The forecaster devises and formulates all necessary warning, advisory and forecast products assigned to his/her forecast "desk", with emphasis on meeting user needs.

Meteorologist Intern

The Intern is a meteorological trainee, involved in forecasting and interpretive studies and/or conducting related projects and programs. The Intern adapts general forecasts to conform to observed local weather phenomena and prepares warnings and advisories. Once qualified, the Intern warns or alerts general public of immediate danger situations such as hurricanes, tornadoes and other severe storms by issuing local statements, warnings and advisories in accordance with procedures. The intern also retrieves and evaluates climatological data from standard data sources and analyzes and reports data using standard statistical methods and procedures.

Hydro-Meteorological Technician (HMT)

The HMT provides a full range of technical support and assistance to shift operations of the WFO. Those activities include: forecaster assistance, data management and acquisition, public service and user interaction. The HMT assists the Data Acquisition Program Manager (DAPM) or the Observing Program Leader (OPL) in planning, developing, monitoring, managing, assuring and controlling the quality of numerous mesoscale data sources in the WFO area.

Electronics Technician (ET)

The ET provides field maintenance technical services (e.g., installation, maintenance, troubleshooting, repair, calibration) and related support for a wide range of complex electronic, electro-mechanical, data acquisition, communications equipment and standalone and networked computer systems. The ET implements nationally issued technical orders (e.g., system/equipment modification, software upgrade) issued by higher levels; plans and conducts complex tests and analyzes results. The ET also provides Information Technology (IT) support in the administration, monitoring, operation and maintenance of the site's computer systems, Local Area Networks (LANs), Wide Area Networks (WANs) and associated hardware and software.

River Forecast Center (RFC) Staff

Hydrologist-in-Charge (HIC)

The HIC provides oversight for all RFC activities and the technical aspects of hydrologic services in his/her area of responsibility. The HIC is involved in the many cooperative efforts with other NWS offices as well as water management and hydrologic-oriented agencies outside the NWS. The HIC manages the RFC involvement in these areas and provides overall direction of the staff effort given to maintaining and improving a variety of RFC services to WFOs and outside authorities and agencies.

Hydrologist: Development and Operations (DOH)

The DOH provides direction for integrated implementation and operational support for the high levels of technology employed in the RFC. Under the direction of the HIC, the DOH interacts in a collaborative effort with the Hydrologic Research Laboratory (HRL) and the Hydrologic Operations Division (HOD), as well as with the regional headquarters to support the movement toward more advanced hydrologic modeling systems and data analysis. The DOH has overall responsibility for assessment of data and forecast systems deficiencies along with providing direction for system modifications and enhancements; oversight of the complex details associated with training for the RFC staff is also an important responsibility.

Service Coordination Hydrologist (SCH)

The SCH is a management level position at each of the RFCs designed to provide a more coordinated and consistent response in assessing user needs. The SCH is completely knowledgeable of new science and forecast methods with regards to RFC operations. The SCH also serves as manager of the RFC outreach programs in order to effectively provide maximum impact in fostering relationships between the RFC and cooperating agencies and partners.

Senior Hydromet Analysis and Support (SHAS) and Hydromet Analysis and Support (HAS)

Each RFC has one SHAS forecaster and two journeyman-level HAS forecasters, who are responsible for the Hydrometeorological Analysis and Support (HAS) function of the RFC. These forecasters lead the effort to facilitate effective utilization of large volumes of hydrometeorological information and forecast products in order to capitalize on technological improvements and scientific advances. Duties include: processing, quality control and assimilation of real-time hydrometeorological data, especially radar-based precipitation fields; assimilation and quality control of hydrometeorological forecasts; analysis of upcoming hydrometeorological events; coordination with other NWS offices and cooperators, and production of hydrometeorological discussions and other coordination products.

Senior Hydrologist (SRHYD)

The Senior Hydrologist serves as the lead hydrologic forecaster for the day-to-day operations of the RFC. In addition, Senior Hydrologists have in-depth expertise in one or more specialty area such as flash flood hydrology, extended-range streamflow forecasting, hydrometeorological data systems, computer systems and advanced modeling techniques. Senior hydrologic forecasters apply their area of expertise towards the procedure development needs of the RFC. They also provide advice and training in their area(s) of expertise to hydrologic forecasters, HAS forecasters and hydrologic interns. SRHYDs also assist with the RFC HAS functions and are part of the HAS shift rotation.

Hydrologists (HYD)

Hydrologists perform the daily hydrologic operations of the RFC, including both hydrologic forecasting duties and operational support. Hydrologists collect, analyze, disseminate and manage networks of basic water resource data, such as information on reservoir and lake storage, ground water levels, and surface and ground water quality. The Hydrologist develops and modifies hydrologic procedures, models, techniques, and plans to ensure optimal use of technologies and data. The Hydrologist performs daily hydrologic forecast functions including short-range forecasting during high water and flood events, stage forecasts, daily forecasts, river velocity forecasts, etc. The Hydrologist performs long-range hydrologic forecasting to include spring snowmelt, flood outlooks, river volume, etc.

Note: RFCs also employee a Secretary (SEC) and Hydrologic Technicians (HT), who perform functions very similar to the ASA and ET described in detail under the NWS WFO Staff.

National Weather Service Directives System (NDS)

The NWS Directives System translates the ideas, goals or principles contained in the NWS mission, vision, and strategic plan into action-related directives. Specific information about NWS forecasts, warnings and services provided can be found in the NDS.

NDS Organization

There are three types of directives in the NDS:

- **Policy Directives:** Statements of important, high-level direction that guides decisions and actions throughout the NWS.
- **Procedural Directives:** Describes how policy directives are implemented.
- **Supplements:** Contain detailed information on implementation of procedural directives.

Who Can Use NDS?

The NDS is accessible to everyone via the following web link. All users of NWS services, forecasts and warnings will find a wealth of detailed information in the NDS: http://www.nws.noaa.gov/directives/index.htm

Below is a snapshot of the NDS index. Most users will commonly use information on NWS "Operations and Services" found in Section 10.